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Thiol Capped Gold Nanoparticles-based Colorimetric Sensor for Mercury detection

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Abstract. Conjugation of mercaptopropionic acid (MPA) as a thiol-capping agent linked with gold nanoparticles (AuNPs) enables colorimetric heavy metal detection. The synthesized AuNPs followed by thiol-capped AuNPs shows a color changes from red wine to deep color of gold nanoparticles. The quantitative measurement was performed with UV-Vis absorption spectrum, indicating a sharp peak centered at range of 520 nm to 540 nm shifted to 561.50 nm upon linked capping agent. Fourier transform infrared (FT-IR) analysis further confirmed the presence of ligand capped on AuNPs. For this project, thiol-capped AuNPs was used to detect Hg (II). The color changes were observed as the various concentration of Hg (II). Further characterization was performed with UVVis, showing the shifting of the maximum absorption peak. This indicates the method used to determine Hg (II) was simple and fast which can detect as low as 0.1 mM.

Keywords: AuNPs,colorimetric, Mercury,Thiol-capping